

### REMARKS

Reconsideration of the application is respectfully requested. Claims 1-13, and 55-57 are pending. Claims 1-13, and 55-57 are subject to a rejection under 35 U.S.C. § 103 (a). Claims 14-54 were previously cancelled.

Claims 1-13, and 55 - 57 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Chem Systems "Developments in Dimethyl Carbonate Production Technologies" 99/00S6, May 2000 (Chem Systems) and U.S. Patent No. 4,434,105 to Buysch et al. (Buysch) each in combination with each other and in view of Lichtenwalter et al. (U.S. Pat. 2,773,070), McClellan (U.S. Pat. 2,873,282), Raines et al. (U.S. 4,233,221) and Pacheco et al. (U.S. 5,489,703).

Claim 1 relates to an integrated process for producing a dialkyl carbonate and a diol that comprises reacting in a first reaction zone an alkylene oxide with carbon dioxide in the presence of a homogeneous carbonation catalyst comprising bicarbonate at 50 to 200 °C and at least 1379 kPa to provide a crude cyclic carbonate stream comprising a cyclic carbonate and the bicarbonate catalyst. The crude cyclic carbonate stream is directed into a second reaction zone, wherein the cyclic carbonate is reacted with an aliphatic monohydric alcohol in the presence of the homogeneous carbonation catalyst from the crude carbonate stream to provide a crude product stream comprising a dialkyl carbonate and a diol, wherein the crude cyclic carbonate stream has not been subjected to a separation other than to remove an amount of unreacted alkylene oxide, an amount of unreacted carbon dioxide, or both, and wherein the homogeneous carbonation catalyst is a mixture comprising a halide containing component and a bicarbonate.

It is respectfully submitted that the Examiner has focused on the wrong issue with respect to obviousness. The issue is not only whether a sequential process employing two reaction zones would or would not be obvious over the prior art teachings of the addition of all the ingredients at once in a single reaction zone. The issue of non-

obviousness additionally should be patentably directed toward the results of reacting sequentially in two reaction zones.

In any event, the undersigned once again addresses the position of obviousness presented by the Examiner. The Examiner has essentially stated that applicant's claims are obvious over Buysch et al. (Buysch) and Chem Systems "Developments in Dimethyl Carbonate Production Technologies" 99/0086, May 2000 (Chem Systems) and now further in view of Lichtenwalter et al., McClellan, Raines et al. and Pacheco et al. The Examiner has stated that the addition of ingredients sequentially instead of simultaneously, as taught in each of Buysch and Chem Systems is, *prima facie* obvious because one skilled in the art would expect to obtain a dialkyl carbonate and a diol. Firstly, the Examiner has merely stated her own opinion. The Examiner has not presented any evidence of obviousness to support her own opinion. Absent some sort of evidentiary affidavit supporting the Examiner's opinion or absent some evidence that a sequential process is obvious over the single reactor process for this type of chemical process, it is respectfully submitted the rejection must be withdrawn. The secondary references do not solve the deficiency of the primary references as they simply do not do not address the sequential reaction as instantly claimed.

The Examiner has admitted to that difference between the processes of Buysch and Chem Systems and the process instantly claimed, i.e. that the prior art teaches the addition of all ingredients at once instead of sequentially in two reaction zones as instantly claimed. Nevertheless, the Examiner has not presented any publication that would present a nexus between the prior art teachings and the sequential reaction system in accordance with the claimed invention. There is no combination of references showing the sequential reaction for this chemical reaction/process is obvious over the single reactor system. Repeating, all that the Examiner has cited is prior art demonstrating a single reactor system and then, based merely on her own opinion, reaches a conclusion of obviousness. The Examiner states that the claimed process is no more than a "selective combination of prior art teachings done in a manner obvious to one of ordinary skill in the art...." The undersigned respectfully notes there is no prior art of record that was selected for the sequential reaction in accordance with the claim. In

fact there is no reference of record from which the Examiner can state anything was selected to make the sequential reactor reaction obvious for the particular claimed chemical reaction/process. It is interesting that for this particular art, the industry apparently never had the concept of employing a two reactor system. It is believed that such absence is a true measure of non-obviousness.

Further the Examiner cites In re Mostovych, 144USPQ 38 (1964). It is respectfully submitted that since the alternative steps "known in the art" required for that decision are not present in the instant rejection, In re Mostovych is not applicable. The Examiner has failed to present such alternative steps excepting that which comes from her own opinion. Additionally, the Examiner has stated, "One skilled in the art would have been motivated to utilize the processes taught by the prior art to arrive at the instant claimed process with the expectation of obtaining a dialkyl carbonate and a diol." The undersigned respectfully asks where is the processes taught by the prior art showing the sequential reactors for the particular chemical reaction/process as instantly claimed? Further the Examiner states, "The instant claimed process would have been suggested to one skilled in the art ..." but where is the teaching or suggestion (other than the Examiner's own opinion) to establish a case of obviousness. The Examiner suggests that a side-by-side showing of unexpected, beneficial and superior results over the processes taught in the prior art is required. It is respectfully suggested that such a showing is only required when the Examiner has established a *prima facie* case of obviousness. Absent any suggestion (other than the Examiner's opinion) of the sequential two reactors system and process as instantly claimed it is respectfully urged that no *prima facie* of obviousness has been established.

An additional difference between Applicants' claims and the Buysch and Chem Systems references is the respective catalyst systems. The Examiner cites Lichtenwalter et al., McClellan, Raines et al. and Pacheco et al. to support the absence of certain catalyst ingredients in the primary references. As previously amended, Applicants' claim a homogeneous carbonation catalyst, which is a mixture comprising a halide containing component and a bicarbonate. In contrast, Buysch and Chem Systems make no reference to a catalyst system comprised of a mixture of a halide containing component and a

bicarbonate. Therefore, it cannot be fairly stated that the Buysch and Chem Systems references, alone or in combination, teach or suggest the use of Applicants' claimed catalyst system. Further the Examiner's use of the secondary references to establish obviousness fails to fill this gap. There is still no teaching by the secondary references of the sequential two reactor process as instantly claimed, alone or with the specified catalysts. Accordingly, withdrawal of the 103(a) rejection to claims 1-13, and 55-57 is respectfully requested.

In any event, it is the results of the sequential reactor system which also causes the instant claims to be non-obvious. As any ordinary chemist knows, if methanol, ethylene oxide and carbon dioxide are added at once as in the prior art, a lot of ethylene oxide would react directly with methanol to make, e.g. C-O-C-C-OH, an undesired byproduct. In accordance with the instantly claimed process the undesired byproduct is avoided, truly a beneficial results leading to a superior process over the prior art. No one in the prior art fairly discovered Applicant's process and such discovery solves a long felt need to avoid such undesired byproducts. Another beneficial aspect leading to the superior results is the fact that splitting up to two steps allows one to optimize the conditions for each step and allows for removal of components like unreacted CO<sub>2</sub> and ethylene oxide thereby facilitating separation after the second step.

In view of the above remarks, it is respectfully submitted that the claims are in condition for allowance. Prompt notice of allowance is respectfully solicited.

Respectfully submitted,

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